DRAFT

The Bayou Builders:

A History of the U.S. Army Corps of Engineers, New Orleans District, 1976-2000

By

Damon Manders
Alabama A&M University Research Institute
August 2002

Chapter Four

Weathering the Storm: New Orleans District and Hurricane Protection Projects

Since enactment of the Mississippi River and Tributaries Project after the 1927 flood, the Corps of Engineers threw itself into large-scale construction to protect the Mississippi Valley from river flooding. As the Corps completed most of the major elements of this plan in the 1960s, it turned to confront another frequent threat to Louisiana – hurricanes. Under the Flood Control Acts of 1962 (PL 87-874) and 1965 (PL 89-298) and other legislation, the Corps developed plans to protect vulnerable areas from the damaging flood surges that accompany hurricanes and other tropical storms. Because the most vulnerable areas in the New Orleans District are adjacent to wetland areas, environmental concerns became even more evident with hurricane protection projects than with other, more established Corps projects. The District adjusted project planning to meet new environmental regulations and, by 1990, became a proponent of environmental protection even as it worked against time to provide protection against these severe storms.

Hurricanes have long been a scourge to U.S. coastal regions, causing billions of dollars in damages, taking hundreds of lives, and discouraging long-term development. This was particularly true in Louisiana. From 1559 to 1969, 160 recorded hurricanes struck Louisiana – an average of more than one storm every three years. The first half of the twentieth century, before storms were given names, no less than three major storms hit Louisiana. More recently, hurricanes Audrey in 1957, Betsy in 1965, and Camille in 1969 earned reputations as killers. Though only a Category 2 hurricane on the Saffir/Simpson scale,[1] Betsy was extremely destructive, leaving 81 people dead, injuring 17,600, and causing more than

[1] The Saffir/Simpson Scale is a method developed in the early 1970s to measure storms based on wind speed, tidal surge, and central pressure. Wind speed and tidal surge, respectively, for each category are Category 1: 74-95 mph,

$2.4 billion in damages over four parishes. In 1969, Hurricane Camille – a Category 5 hurricane – devastated a 512,000-acre area in Louisiana and Mississippi and killed 256 people. While other states have received similar destruction, it was with good reason the National Weather Service and other weather watchers labeled New Orleans the most vulnerable city in the nation for a hurricane strike.[2]

[Figure 28. Hurricane Betsy]

As a result of the constant threat of hurricanes, Congress began to develop legislation for building hurricane protection works and improving emergency response. In 1954, Congress authorized surveys for the construction of levees, floodwalls, and other structures to protect against hurricanes. The Corps developed the concept of a standard project hurricane (SPH), defined as the most severe storm reasonably characteristic of a specified region, and a probable maximum hurricane (PMH), the most severe storm possible in a region. Based on their research, the SPH for Louisiana was a storm somewhere between the sizes of Betsy and Camille. With a predicted approach over the mouth of the Mississippi and across Lake Borgne, the SPH would flood about 700,000 acres to depths of 16 feet. Since it had no effective way to fight heavy winds, the Corps focused on preventing tidal surges, usually the most destructive part of a hurricane. Recommendations for New Orleans included levees along the Mississippi from New Orleans to Venice, Louisiana; on the east bank of Lake Pontchartrain; and along the coast in the vicinity of Grand Isle and Golden Meadow. Starting with the Flood Control Acts of 1962 and 1965 and following with the Water Resources Development Acts of 1974, 1986, 1990, 1992, and 1996, Congress authorized and appropriated the necessary funds to study and build these projects.[3]

4-5 ft.; Category 2: 96-110 mph, 6-8 ft.; Category 3: 111-130 mph, 9-12 ft.; Category 4: 131-155 mph, 13-18 ft.; Category 5: 155+ mph, 18+ ft.

[2] Land's End, pp. 77-80; Delta Engineers, p. 36; Todd Shallat, "In the Wake of Hurricane Betsy," Transforming New Orleans, pp. 121-137; "Hurricanes" (NOD-PAO File, Lake Pontchartrain and Vicinity Hurricane Protection Project); Mike Dunne and Bob Anderson, "Louisiana coast ripe for storm disaster," Baton Rouge Advocate (Sun., May 23, 1982): 1. See also the NOAA public Internet site (www.ncdc.noaa.gov) for historical data on hurricanes.

[3] Land's End, pp. 77-81; "Hurricanes."

In addition to authorizing protective structures, after 1950 Congress adopted measures to improve emergency response by providing for flood control, technical assistance and supplies, interagency cooperation, and debris removal. The Disaster Relief Act of 1950 (PL 81-875) provided for the Corps to help local authorities plan for disasters, furnish technical assistance, and provide emergency relief and resources for coping with a disaster. The Emergency Flood Control Work Act of 1955 (PL 84-99) empowered the Corps to support flood fighting and provide rescue and emergency relief during storms, as well as to repair damaged protective works. Later, the Federal Disaster Relief Act of 1974 (PL 93-288), amended as the Robert T. Stafford Disaster Relief and Emergency Assistance Act (PL 100-707) in 1988, required the Corps to support the Federal Emergency Management Agency (FEMA) and other agencies in planning for and responding to disasters and emergencies. In addition to support during emergencies, the District participated in a number of studies with FEMA, most notably the Southeast Louisiana Hurricane Preparedness Study. This 1990 study examined shelters, parish capacity and vulnerability, and evacuation times to support parish government planning in a nine-parish area. Evacuation time was a particular concern because of growing populations and the small number of evacuation routes. The District also participated in periodic exercises to gauge response to a mock hurricane.[4]

The more difficult work, however, was completion of the hurricane protection projects. After the passage of the National Environmental Policy Act (NEPA) in 1969, the District re-evaluated and modified many projects to meet legal requirements and resolve concerns about the environment. The District also had to resolve funding issues. Many local agencies faced difficulties in raising the resources required to share the costs, causing delays in several projects. One project, the Morgan City and Vicinity Hurricane Protection Project, did not go forward at all despite completion of designs and environmental impact statements prior to 1973. As time dragged on without any real progress on the other projects and as recurring hurricanes threatened the region, pressure increased from local government agencies and Louisiana's congressional delegation to move forward. There were also pressures on local communities to

[4] Ibid.; NOD, Emergency Response (n.p., n.d.); Dunne and Anderson, "Louisiana coast"; "Hurricane preparedness study for Southeast Louisiana," Riverside (Nov. 1989): 4; Aitken, "City shut down by record flood," Riverside (June

obtain the flood protection necessary to participate in the National Flood Insurance Program under the Flood Disaster Protection Act of 1973 (PL 93-234), which makes flood insurance available in flood-threatened communities provided they adopt flood protection measures. Given the financial position of local communities and continued threats, it became more and more important to complete the projects.[5]

New Orleans to Venice, Louisiana

One of the first hurricane protection projects to make significant progress, and the first to face environmental scrutiny, was the New Orleans to Venice Hurricane Protection Project, formerly the Mississippi River Delta at and below New Orleans Hurricane Protection Project. Authorized by the Flood Control Act of 1962, the project consisted of a series of back levees – a second set of levees behind the MR&T levees along the Mississippi River in Plaquemines Parish. The project would protect 75 percent of the population and improved lands in the delta area south of New Orleans from tidal surges. By 1970, the District had made significant progress on the plan, beginning construction on levees from Venice to Tropical Bend in 1966 and from Phoenix to Bohemia in 1968. The District also developed designs to complete the remaining 35 miles on the east bank, which would consist of a combination of new levees and repair of existing state levees from Bohemia to just below Baptiste Collette Bayou across from Venice, as well as raising MR&T levees to hurricane protection heights from Fort Jackson to Venice on the west bank.[6]

After enactment of NEPA, the District put the project on hold to meet legal requirements by gathering input from the U.S. Fish and Wildlife Service (FWS) and other agencies and drafting an environmental impact statement (EIS), beginning in April 1971. On November 4, 1971, Edward Carlson,

---

1995): 4-5. During the 1995 exercise, the District faced a real emergency – an 18-inch deluge and flood.

[5] For more on the Morgan City project, see Project Maps Book, Flood control projects 2-36A, Morgan City and Vicinity Hurricane Protection, Condition of Improvement, Sept. 30, 1995 (NOD, 1995) and Fact Sheet (NOD-PAO File, Morgan City).

[6] Project Fact Sheet, New Orleans to Venice, Louisiana Hurricane Protection (New Orleans: NOD, 12 Apr. 2001); Announcement of Public Meeting, Mar. 18, 1986; Letter, Edward Carlson to District Engineer, Nov. 14, 1971 (NOD-PAO File, New Orleans to Venice Hurricane Protection Plan).

the regional director of the FWS, replied that while the levees would have positive effects, they would also have wide-ranging negative effects, including alteration of historic habitats, increased wetlands erosion, and increased industrialization resulting from improved access to formerly isolated areas. His recommendation was to restrict land use and build a freshwater diversion structure near Fort St. Phillip to provide freshwater nutrients to wetland areas. District Engineer Col. Richard L. Hunt's response in December 1972 was that the levee would have "minor" impact on flooding and that the effect on marshland would be "insignificant." In his opinion, land use restrictions were not authorized, and the diversion structure was not justified. Despite the continued misgivings of the agencies, the District published the EIS in January 1975 recommending the east bank levee plan as originally conceptualized.[7]

District engineers proceeded with the general design memorandum while continuing discussions with the agencies about the project. In the interim, several gaps had appeared in existing state-built levees on the east bank of the Mississippi between Bayou La Moque and Baptiste Collette Bayou, allowing the river to inundate neighboring wetland. On July 27, 1976, the District announced its intention to rehabilitate the levees as emergency repairs under authority of PL 84-99. In October 1976, the FWS requested a delay in the project to investigate the possibility of leaving the gaps to allow overflow of Mississippi water into the wetland. It would spend the next several years debating this project with the District. With the changes in environmental conditions that had occurred and ensuing questions about the impact of the east bank levee plan, the FWS requested in January 1980 that the District revise the EIS and design memorandum, then 90 percent complete. Ironically, Plaquemines Parish fishermen had been complaining that fresh water from the gaps in the levee were hurting their oyster crops, and they eventually made known their desire to close the gaps to Louisiana Congressman Robert L. Livingston and

[7] Letter, Carlson to DE; Letter, Lyle S. St. Amant to Edward Carlson, Feb. 8, 1973; Letter, Phillip Morgan to DE, Sept. 7, 1973 (New Orleans to Venice file); New Orleans to Venice, Louisiana, Barrier Hurricane Protection Project, Final Supplemental Environmental Impact Statement (New Orleans: NOD, Nov. 1987): 1-3; New Orleans to Venice, Louisiana Design Memorandum No. 1 and General Design Supplement No. 2, East Bank Barrier Levee Plan, Draft (New Orleans: NOD, June 1976); Hunt quoted in Morgan letter. This was not the first time Hunt appeared insensitive to environmental issues; see also Shallat, "Hurricane Betsy," p. 132.

the Corps in February 1980. By this time, however, the District had already put the project on hold to re-evaluate it.[8]

The District submitted a supplemental EIS in 1985 to provide environmental mitigation features – gated culverts or crevasses in the levees – for the east-bank plan. Because of concerns about the environmental impact, the District held a public meeting the following year, where it presented both the east-bank plan and a west-bank plan that provided for enlargement of existing MR&T levees from City Price (near St. Jude) to Venice. Attendees generally favored the west-bank plan, which provided an equal level of protection with fewer environmental impacts and lower cost. They also expressed concern that the project be completed as soon as possible, and the District agreed to speed up the schedule. By the end of 1987, the District had completed redesigns, published the supplemental final EIS, and issued $3.7 million in contracts to begin raising the levees. The final design included two gated culverts, five crevasses, and a floodgate at Empire, as well as creation of marshes using dredged material in the Pass á l'Outre State Waterfowl Management Area. The District worked closely with the parish to get the remaining cost-sharing assurances, including assurances for a non-federally funded post-authorization change to enlarge the back levees from St. Jude to City Price. By 2001, the District had completed 79 percent of the $247-million project, including all environmental mitigation features. Estimated date of completion was 2017.[9]

[Figure 29. New Orleans to Venice Hurricane Protection Plan]

[8] Letter, Cary W. Kerlin to District Engineer, Jan. 29, 1980; Letter, Livingston to Thomas A. Sands, Feb. 12, 1980; Letter, Sands to Livingston, Mar. 17, 1980 (New Orleans to Venice file).
[9] New Orleans to Venice FEIS, pp. 1-7; Project Fact Sheet, New Orleans to Venice; Project Maps Book – Flood Control Projects 2-32A, New Orleans to Venice, Louisiana (Hurricane Protection), Condition of Improvement, 30 Sept. 1997; Announcement of Public Meeting, Mar. 18, 1986; "1986 – It was a very good year for NOD," Information Bulletin (Win./Spr. 1987): 5; "The Building of Hurricane Protection," Riverside (Sept. 1989): 1-3.

Lake Pontchartrain and Vicinity

The largest and most controversial hurricane protection project to come out of the 1960s was the Lake Pontchartrain and Vicinity Hurricane Protection Project. In September 1965, Hurricane Betsy had revealed the vulnerability of New Orleans to hurricanes along Lake Pontchartrain. Investigations and modeling at WES in 1962 showed that levees along the lake front and gated control structures (barriers) at the Chef Menteur Pass, Sea Brooks, and Rigolets channels from Lake Borgne to Lake Pontchartrain would be an effective shield against flood surges. The British had used similar storm barriers since 1953. Congress authorized the project in the Flood Control Act of 1965, but passage of NEPA delayed completion of the final design as the District gathered interagency input and prepared an EIS. The District completed the EIS in 1974, but concern that the EIS did not meet legal requirements led Save Our Wetlands, the Clio Sportsman's League, the St. Tammany Parish Police Jury, and other organizations to file suit to stop the project in 1975. During the trial in late 1977, the Corps faced a number of setbacks when testimony revealed that the District used a single expert rather than the multidisciplinary approach called for by NEPA and that the EIS did not reference a newer study that was initiated prior to 1974. However, the biggest objection was that the EIS relied on the 1962 studies and did not take into account modifications to the project that the District made to meet the goals of the EIS. The latter led one witness to call the Corps "negligent" and the judge to conclude the EIS was "misleading." As a result, the court forbade further construction on the project in late December 1977.[10]

Complicating matters, public opposition to the plan led U.S. Rep. Robert Livingston to seek a moratorium on construction in October 1977 until the project could be re-evaluated. Initially, the District agreed, but Maj. Gen. Robert C. Marshall, the Lower Mississippi Valley Division Engineer, reversed this decision at the last moment because of concerns that delaying the project might put New Orleans in jeopardy. The December court decision eventually had the effect of putting this moratorium in place.

---

[10] Shallat, "Betsy," pp.133-136; Save Our Wetlands, Inc. et. al. Vs. Early J. Rush III et. al., 77-3710 U.S. (E. La. Dist. Dec. 30, 1977); "Expert Tells Court Corps 'Negligent in Lake Plan'," Alexandria Daily Town Talk (Dec. 28, 1977): 1.

Nevertheless, at Livingston's urging, the House of Representatives Public Works Subcommittee on Water Resources scheduled a hearing in New Orleans to review the project in early January 1978, only days after the court handed down its decision. This gave 15 representatives from several of the groups with an interest in the project the chance to air their grievances. It also demonstrated the complexity of the project, with some favoring the Corps' barrier plan, others favoring a "high level" plan of building higher levees without control structures, and still others wanting examination of additional consequences to their parishes. [11]

On one side were the plaintiffs for the suit and their lawyers, who recapped many of their arguments at trial – that the Corps had not properly considered alternatives, that the plan was based on a dated study, and that a new EIS was necessary. Local government representatives were more divided, representing a range of views. State Rep. Edward C. Scogin, representing St. Tammany Parish, was primarily concerned that the barriers would cut off the lake and prevent its use for fishing, shipping, and recreation. Representatives from the Orleans Levee Board and Jefferson Parish, as well as the newly elected mayor of New Orleans, Ernest N. Morial, voiced reserved support for the barrier plan and expressed concern that delays in implementing the 13-year-old, already-funded plan would place the city in danger. State Rep. Samuel B. Nunez, representing St. Bernard Parish, objected to the inclusion of the Chalmette Loop portion of the levee in the court's injunction since this part of the project was nearly halfway complete and protected 80 percent of parish residents. Of the other parishes, the St. John the Baptist representative expressed concern about the effect the barriers would have on flooding, and St. Charles had previously stated its intention to withdraw from the project. For the Corps, District Engineer Col. Early J. Rush argued forcefully for the barrier concept, noting the higher cost and greater chance of flooding with the high-level plan. The barrier plan had been tested, approved by Congress, and was partially complete. As for environmental arguments that the gated structures at Rigolets, Chef Menteur Pass, and Sea Brooks would cut off needed water flow, Rush argued that "contrary to what you may have

[11] "The Corps and the Barriers," Times-Picayune (Oct. 25, 1977): 1:10; "Barrier project debated," Slidell Daily Sentry-News (Dec. 6, 1977); Livingston, "Report from Washington," St. Bernard News (Feb. 1, 1978).

heard, the barrier complexes will not dam the passes or create a 'dead lake.'" Rather, the structures would remain open except during hurricanes, and a lock would allow continued traffic.[12]

Although a poll conducted by Livingston after the meeting showed only slightly more people against the barrier plan than for it, newspaper polls found people mostly against it, and those against it tended to be more vocal. This affected the support of Congress, and Livingston later wrote that the meeting "clearly showed the committee members the difficulties involved in the proposed plan – its possible effects on the northern boundaries of Lake Pontchartrain, and its dangers to our wetlands." While the majority of the plan stood in suspension, there was, nevertheless, some agreement among the parties to allow the District to continue with parts of the project. Some project elements were not covered in the injunction, such as several reaches of lakefront levee sponsored by the Orleans Parish Levee District. Little opposition existed to the District proceeding with these parts of the project. There was also general agreement that the court should exempt from the injunction parts of the project that protected more populated areas and had minimal environmental impact, in particular the Chalmette Loop. With Livingston's support of this modification, the District requested the court to revise its injunction, which it did on March 10, 1978. Finally, there was general agreement that further study would enhance the project. The District had already initiated a new study of Lake Pontchartrain and the barriers with the Louisiana State University (LSU) Center for Wetland Resources the previous year, and this study would eventually form the basis for a new EIS.[13]

By 1981, after completion of the LSU study and another by the University of New Orleans, the District had largely accepted the high-level plan as an alternative to the barrier plan. Preliminary study data had indicated its feasibility, and the chief of engineers could approve it more rapidly using his discretionary authority. The more controversial barrier plan would require a more extensive EIS and

---

[12] Dale Curry, "Hearing Shows Hurricane 'Barriers' Plan Has Few Supporters," Baton Rouge Morning Advocate (Jan. 6, 1978): 1; Susan Finch, "No lake barriers, no plan – official," New Orleans States-Item (Thurs., Jan. 5, 1978); "Effect Could Be Devastating, Nunez," St. Bernard Voice (Jan. 6, 1978); Attachment No. 1 to Colonel Early J. Rush III's Testimony at the Public Hearing Held by the Congressional Subcommittee on Water Resources, Jan. 5, 1978 (Lake Pontchartrain file).

likely take longer to approve. After a public meeting in November 1981 to gauge public opinion, the District evaluated the high-level plan, published a revised EIS in July 1984, and received project approval from the chief of engineers in 1985. The project consisted of the High-Level and Chalmette Plans. It included a strengthened Mandeville Seawall as well as levees and floodwalls from the Bonnet Carré Spillway to St. Rose Canal near the Jefferson Parish border; along the New Orleans lakefront and Inner Harbor Navigation Canal; from Southpoint, Louisiana, to the GIWW; along the MR-GO; and from the MR-GO to Caernarvon. The District developed a separate EIS in 1988 for the environmental mitigation features, which consisted primarily of a segmented rock breakwater along the Manchac Wildlife Refuge.[14]

After Hurricanes Danny, Elena, and Juan struck Louisiana in 1985, the project regained urgency, and Congress reauthorized it and authorized new Jefferson Parish sections, in the Water Resources Development Act of 1986. It became a "fight against time," as Col. Eugene S. Witherspoon said in a 1986 press conference. That year, the District issued the last contract to complete the New Orleans lakefront levees, which were anywhere from 50 to 85 percent complete except for four floodwalls. Work also progressed on the Chalmette Area Plan, which was between 70 and 99 percent complete. When finished, these projects would provide basic protection to the lakefront area of New Orleans and to St. Bernard Parish. After more than 20 years in delays and disputes, Colonel Witherspoon could finally say that the project "is an excellent example of a federal/local partnership that is working to offer hurricane flood protection to the residents of our area."[15]

By 1994, the project was 80 percent complete. The following year, the District made considerable progress on several of its more controversial aspects. The District completed the Mandeville Seawall

---

[13] Livingston, "Report from Washington," St. Bernard News (Feb. 1, 1978); Save Our Wetlands, Inc. et. al. Vs. Early J. Rush III et. al., 75-3710 U.S. Order (E. La. Dist. Mar. 10, 1978); "Pontchartrain wetlands study planned," New Orleans States-Item (Thurs., Jan. 26, 1978): C2.

[14] Lake Pontchartrain, Louisiana and Vicinity Hurricane Protection Project, Combined Phase I Type General Design Memorandum and Revised EIS Plan of Study (NOD, 1981): 1-10; Lake Pontchartrain and Vicinity, Louisiana Hurricane Protection Project Reevaluation Study, Mitigation Report and Final Supplement 1 to EIS (New Orleans: NOD, July 1984): 1-8; Mitigation Study, Lake Ponchartrain and Vicinity, Louisiana Hurricane Protection Project (New Orleans: NOD, Nov. 1988): ii-vi; NOD News Release, Nov. 18, 1981.

[15] Witherspoon quoted in Notes for Briefing on Lake Pontchartrain and Vicinity Project: Orleans Levee Board Press Conference, May 30, 1986 (Lake Pontchartrain file); "Construction Moves Ahead on All Fronts," Information

under PL 99-662 funding. The 10 miles of levees from the Jefferson-St. Charles Parish line to the east Bonnet Carré guide levee also went forward. This was an alternative alignment to the St. Charles lakefront levee, to which the District had deferred because of the impact on wetlands. Although the alternate alignment parallel to and north of Airline Highway cut through wetlands, it would help preserve an additional 25,000 acres. Construction of the first of several sections of this levee started in November 1991 with a projected completion date of 2013. Another area where the District made progress was providing protection along the London Avenue, Orleans Avenue, and 17th Street canals, which drained into Lake Pontchartrain. Unprotected, the canals would be a major gap in the hurricane protection plan. The District proposed building structures where the canals met Lake Pontchartrain. However, the Orleans Levee District and New Orleans Sewage and Water Board did not favor this plan because of concerns that these structures would impede drainage, preferring instead more expensive walls and levees. Once Congress approved, the District began the construction, which included lining the three canals with I-walls, providing ten flood-proof bridges where roadways cross the canals, and adding fronting protection to pump stations. By 2001, the Chalmette section of the project was almost complete, work in Orleans Parish was 90 percent complete, work in Jefferson Parish was 75 percent complete, and work in St. Charles Parish was 25 percent complete. Anticipated project completion date was 2013.[16]

[Figure 30. The Lake Pontchartrain Plan with protected canals in center]

Bulletin (Spr. 1986): 8; "Water Resources Development Act of 1986," "1986 – It Was a very Good Year for NOD," Information Bulletin (Win./Spr. 1987): 3-5.

[16] "Hurricane Projects Protect Populated Areas," Riverside (Jul. 1994): 3; Project Maps Book, Flood Control Projects 2-35A, Lake Pontchartrain & Vicinity, Louisiana, Condition of Improvement, Sept. 30, 1997; Wallace, "Levee system to grace St. Charles," (Jan. 1993): 5; "NOD at work," Riverside (Jul. 1995): 7; Project Fact Sheet, Lake Pontchartrain, LA. and Vicinity Hurricane Protection Project, St. Bernard, Orleans, Jefferson, and St. Charles Parishes, LA (NOD, 2001), Memo, Al Naomi to James Addison, Oct. 24, 2001 (Sources file).

The West Bank and Vicinity, New Orleans

The West Bank and Vicinity Hurricane Protection Project, formerly the Westwego to Harvey Canal Hurricane Protection Project, was designed to protect Jefferson Parish residents along the west bank of the Mississippi, an area not included in the Lake Pontchartrain and Vicinity Hurricane Protection Project. The project received its initial authorization from Senate Public Works Committee resolutions dated November 11, 1965, and May 6, 1966, and House Public Works Committee resolutions dated May 5 and October 5, 1966. After holding a preliminary public meeting in 1966, the District conducted the preliminary evaluations of the project from 1966 to 1972. When the District presented its proposed plans at a public meeting for an alignment to protect west bank neighborhoods in July 1972, however, none of the interested groups were satisfied with the plan presented. Several landowners wanted protection extended to areas east of Bayou Segnette, west of Harvey Canal, and north of Bayou Barataria. The Sierra Club wanted the project to be limited only to developed areas, while the FWS simply wanted a plan that posed minimal environmental damage. The National Park Service (NPS) requested that the District consider the impact on the newly proposed Jean Lafitte National Historic Park, a request supported by the Bureau of Outdoor Recreation.[17]

The environmental and park issues came up repeatedly in the years that followed. In September 1972, the Louisiana Parks and Recreation Commission also requested that the project be delayed until the NPS completed a study of the park plan. After postponing its release several times, the NPS finally issued a report in May 1974, recommending against incorporating the park into the national park system. When the District sent a letter to the NPS and Louisiana Parks Commission saying they intended to resume study of the hurricane protection project, the commission responded that they were preparing a feasibility report for a state-run park. Completed in April 1975, this report recommended that all levees be outside the park area. After the District completed the revised study in 1978, Colonel Rush presented 15

[17] West Bank of the Mississippi River in the Vicinity of New Orleans, La. Feasibility Report and Environmental Impact Statement 1 (New Orleans, NOD, Dec. 1986): 6-7; West Bank Hurricane Protect Study Resume of Events, 28 May 1980 (NOD-PAO File, West Bank Hurricane Protection Project)

alternatives with their associated costs, benefits, and environmental data to the Jefferson Parish Council in May of that year. The council chose an alignment for a levee running both north and south of Crown Point. Over the next year, the District modified the alignment no less than four times. First, the EPA requested exclusion of wetlands south of Crown Point. Then Jefferson Parish requested inclusion of the Bayou des Familles levee area. On reviewing this change, the EPA asked to preserve Bayou Aux Carpes Swamp, either by a change of alignment or by introducing floodgates at the two bayous. Then the superintendent of the new Jean Lafitte National Historic Park, created on November 10, 1978, under the Wild and Scenic Rivers Act (PL 95-625), objected to the levees within the park boundary.[18]

In September 1979, the District presented the final alignment. By this time, however, the Jefferson Parish Council was frustrated by the lack of progress on the project. Not only was there continued vulnerability in the region to hurricane flooding, there was also the matter of obtaining flood insurance at lower rates under PL 93-234. Each passing month, the residents and parish government continued to pay high insurance rates. In addition to the problems with the protection levees, the council had faced similar setbacks to its plan to build a pumping station at Bayou Aux Carpes, which had been halted by the Corps in 1974 and opposed by the EPA to protect alligator habitat near Crown Point. After these setbacks, the council rejected the proposed alignment because of additional cost. Instead, they would proceed with construction of the levee without federal aid using the less costly alignment, which they thought could be concluded without lengthy delays. Subsequent events proved this alignment untenable as well.[19]

On October 29, 1980, the District received an application from the council for a locally funded levee project. It said that, "This application ... has evolved from the determination by the Jefferson Parish Council that it is in the public's interest to construct the levee system without Federal funding and the ensuing delays." The following month, the District responded that it had reservations about the council's proposed alignment, which followed the alignment of a rejected 1979 application by the Bayou des

[18] Ibid.; Letter, Sands to James J. Donelon, Sept. 17, 1979 (West Bank file).
[19] Letter, Peter Russo to Richard Krimm, Jan. 9, 1978; Chronological Sequence (West Bank file).

Familles Development Corporation. The District recommended following an alignment similar to what it had presented previously. The council submitted a revised application in June 1981, and the District informed them that an EIS was required. When the council submitted the initial chapters of the EIS in August 1982, the District found them unsuitable and called a meeting to discuss ways to improve them. The council's environmental consultant started revising the EIS, but in early 1983, the council began elevating the dispute by contacting Sen. Russell Long and Rep. Lindy Boggs. Despite another meeting in March to resolve differences, in April the council wrote Senator Long, "this situation has deteriorated beyond reason. The Parish is frustrated, and we have no reason to believe that an acceptable resolution of the problem is in the offering."[20]

The council eventually resubmitted the EIS in the spring of 1984. At public meetings in March and April, the public opposed the council's alignment. In their comments, the FWS and NPS also rejected the alignment, and the District denied the permit in June. However, both agencies voiced support for one alternative with some modification, and the District agreed to approve a permit for this alignment without a new EIS. With no parish money available to begin the project, which the council blamed on not being able to use Bayou des Familles Development or other donated lands, the council never signed the permit. On September 19, and then only after Hurricane Elena, the council voted to turn the project over to the Jefferson Parish Levee District to pursue obtaining federal assistance. Only a few months later, Hurricane Juan hit Jefferson Parish, causing extensive flood damage. Once the Levee District provided local assurances for the project on November 7, Colonel Witherspoon agreed to put the project on the fast track and complete the feasibility study and EIS within a year of receiving funds. These funds became available in January 1986, and the District submitted the study in December, focusing on an alignment running from Westwego to the Lafitte-Larose Highway, avoiding most wetland areas, then back north along the Harvey Canal. Simultaneous with completion of the study, Rep. Robert Livingston worked to authorize

[20] West Bank EIS, pp. 1-10; Letter, Robert C. Lee to Lindy Boggs; Memo to the File: Letter dated Apr. 18, 1983, to Senator Russell Long from the Jefferson Parish Attorney concerning processing of the subject application, Apr. 27, 1983 (West Bank file).

the 22 miles of new levees and floodwalls as the Westwego to Harvey Canal Hurricane Protection Project in the Water Resources Development Act of 1986.[21]

[Figure 31. Westwego to Harvey Canal and East of Harvey Canal projects]

After working out objections to the plan from the EPA, NPS, and Harvey Canal Industrial Association, the District signed a local cooperation agreement with the Jefferson Levee District in December 1990 to split the cost of the $90.1-million project 65/35. In February 1991, New Orleans District issued the first two contracts and in March broke ground on the long-anticipated project. Completion reached 20 percent in 1994 and 49 percent in 1997. The District continued to issue contracts to raise the levees and floodwalls, but because of concerns that the approved alignment did not provide sufficient protection east of Harvey Canal and on the western shore of Lake Cataouatche, the District conducted a feasibility study in 1992 for expanding the project to protect these areas, and submitted an EIS in August 1994 and December 1996 for the respective projects. Congress authorized the changes in the Water Resources Development Act of 1996 as the Westwego to Harvey Canal and East of Harvey Canal hurricane protection projects, subsequently combined in the Water Resources Development Act of 1999 (PL 106-53) as the West Bank of the Mississippi River Hurricane Protection Project. The post-authorization changes included replacement of a west-side levee closure in Westwego with 12 miles of levees and floodwalls and adding a floodgate and 30 miles of levee and floodwalls east of Harvey Canal, including enlargement of federal levees along the Algiers Canal. New Orleans District signed the post-cooperation agreement for the $306-million project with the West Jefferson Levee District April 26, 1999. Construction began in 2001 with a final completion date of 2014. It had taken a generation to work out the many political and environmental issues and start the project. Although personalities played no small

[21] Statement of Findings, June 18, 1984; Joe Darby, "Stormy rift between corps, Jeff holds up hurricane levee," excerpt; Letter, Livingston to Ron Besson, Oct. 1, 1985; Letter, Livingston to Witherspoon, Nov. 1, 1985; Letter, Witherspoon to Livingston, Nov. 25, 1985 (West Bank file); "New hurricane protection project to begin," Riverside (Jan. 1991): 4-5.

part in the delay, the project shows the difficulties of balancing demands for protection, environmental requirements, and limited local funding.[22]

Grand Isle and Vicinity, Louisiana

The Grand Isle and Vicinity Hurricane Protection Project originated with the 1965 Flood Control Act to provide beach nourishment and erosion protection for Grand Isle in Jefferson Parish. As one of the only natural beaches in Louisiana, Grand Isle has been a vacation spot for New Orleans' elite since the 1890s, with a unique Creole culture celebrated in the works of Kate Chopin and others. Bridged in 1931, the island experienced tremendous economic growth as a popular tourist destination. However, its economic fortunes have since declined because of damages and coastal erosion that accompanied the pounding of hurricanes Betsy, Camille, and Carmen and other storms. The Louisiana Department of Public Works attempted to reverse erosion problems, using timber groins along the shoreline in 1952, through beach nourishment in 1954, and by building a jetty on the east end of the island in 1958. All of these projects proved ineffective or had to be continually repaired. After Hurricane Betsy nearly wiped out the island, Congress authorized projects to stabilize and nourish the beaches while protecting the island from further hurricane damage. A Corps-built revetment near a U.S. Coast Guard Station in 1970, a state-built jetty in 1972, and a Corps beach restoration project in 1975, all had limited results. Although Senate and House Public Works Committee resolutions in 1976 reauthorized the more comprehensive Grand Isle project and the District completed the EIS in 1979, the apparent futility of efforts up to that time dissuaded state authorities from making required financial assurances, and local authorities lacked

---

[22] West Bank East of Harvey Canal Hurricane Protection Project Environmental Impact Statement (NOD, 1994); "New hurricane protection project to begin"; "Hurricane projects protect populated areas"; "NOD at Work," Riverside (Jan. 1997): 7; NOD News Release, Mar. 18, 1991; Project Fact Sheet: West Bank and Vicinity, New Orleans, Louisiana, Hurricane Protection Project, May 30, 2000; Project Maps Book, Flood Control Projects 2-41A, Westwego to Harvey Canal, Louisiana Hurricane Protection Project, Condition of Improvement, Sept. 30, 1997; U.S. Congress, An act to provide for the conservation and development of water and related resources, to authorize the Secretary of the Army to construct various projects for improvements to rivers and harbors of the United States, and for other purposes, Aug. 17, 1999, PL 106-53, 106th Cong., 1st Sess., Section 328b.

the resources to proceed. By the early 1980s, annual visitors were down to just 200,000 a year, spelling hard times for the island economy.[23]

In 1982, the Louisiana Legislature authorized the Department of Transportation's Office of Public Works to provide non-federal assurances. The following year, the District signed cost-sharing agreements with the Office of Public Works using state investments in the 1972 jetty for $1 million of credit toward initial costs. The project would consist of a berm and vegetated sand dune held in place by a stone dike 500 feet offshore extending the length of the gulf side. In addition, there would be an expanded jetty to stabilize the western end of the island. Construction of the berm and sand dune began in December 1983 and was complete in the summer of 1985 for $8.9 million. Before completion of the overall project, however, hurricanes Danny, Elena, and Juan tested it to the extreme, ravaging 20,000 feet of the dune – more than half of the project. Though the project was practically destroyed, the result was almost no structural damages on the island during Danny and Elena and only minor damage during Juan, saving the community an estimated $12 million.[24]

[Figure 32. Grand Isle barrier reef]

Almost immediately, the Office of Public Works filed for assistance in restoring the project under PL 84-99. With funding approved by the assistant secretary of the army for civil works and the state committed to local cost sharing, the District proceeded with the request for proposal. Damages from winter storms in early 1987 postponed the bid, but phase one of the project went forward in August 1987. Phase one extended the jetty to partially repair the sand dune and move sand from the sand bar to replace

[23] "Grand Isle: A 'Renewable' Resource," Aquanotes (Dec. 1985): 1-5; Philip D. Uzee, ed., The Lafourche Country: The People and the Land (Lafayette: University of Southwestern Louisiana, 1985): 114-116; Shea Penland and John R. Suter, ed., "Barrier Shoreline Geology, Erosion, and Protection in Louisiana," Coastal Sediments '87 Symposium (New Orleans: American Society of Civil Engineers, 1987): 9-18; Fact Sheet, Grand Isle and Vicinity, Louisiana, Hurricane Protection and Beach Erosion Project, 10 Sept. 1987 (NOD-PAO File, Grand Isle and Vicinity Hurricane Protection Project); NOD News Release, Sept. 12, 1979; Grand Isle and Vicinity, Louisiana Final Revised Environmental Impact Statement (New Orleans: NOD, June 1979).

[24] "Renewable Resource"; Fact Sheet, Grand Isle, 1987; Project Maps Book, Flood Control Projects 2-40A, Grand Isle and Vicinity Hurricane Projection and Beach Erosion, Condition of Improvement, Sept. 30, 1997.

the eroded beach in the East End State Park. Phase two, handled by a separate contract, completed reparations to the sand dune, placed one million cubic yards of sand, built offshore breakwaters to take the brunt of the wave wash, restored ramps and pedestrian crossovers, and planted vegetation to stabilize the dune. The District awarded the contract for the partial fix in September 1987, and the contractor completed the work by February 1988. Despite recognition from Louisiana Governor Buddy Roemer that, without repairs, "a severe storm in the Gulf could have a devastating effect to the island," the state was not able to make the necessary appropriations until July 1989. This second contract was finally complete in September 1991 with total cost of the project reaching more than $12 million.[25]

As it turned out, the project was once again completed just in time as Hurricane Andrew struck Louisiana within the year. The storm caused considerable damage to the beach, dune, and offshore breakwaters. With repairs funded through the 1992 Dire Emergency Supplemental Appropriations Act (PL 102-302), the District issued two contracts and conducted additional studies at WES on how to best position the breakwaters at Grand Isle. Under the first contract, issued in July 1993, the contractor repaired the beach and sand dune for $2.4 million. The second contract provided $2.8 million for reconstruction of the offshore breakwaters. The repairs were completed on April 30, 1995. The District again turned the project over to the Louisiana Department of Transportation and Development and town of Grand Isle. Altogether, the project had cost more than $33 million.[26]

In 1996, a new phase of the project began when Congress authorized additional flood protection – a levee, raised roads, and breakwaters on the bay side of the island – in the Water Resources Development Act of 1996. Using funds carried over from fiscal year 1997, the District completed a preliminary analysis, which found that the project was not economically justified. However, the Water Resources Development Act of 1999 allowed future economic analyses to include "benefits that a storm damage reduction project for Grand Isle and Vicinity, Louisiana, may have on the mainland coast of Louisiana."

---

[25] Fact Sheet, Grand Isle, 1987; Letter, Roemer to Maj. Harold Manual, Dec. 6, 1988; Letter, Manual to Roemer, Dec. 20, 1988 (Grand Isle file); Project Maps Book, Grand Isle; NOD News Release, Nov. 11, 1991.
[26] Project Maps Book, Grand Isle; Project Fact Sheet, Grand Isle and Vicinity, Louisiana, May 20, 2000; "NOD at work," Riverside (Apr. 1993): 7; "Hurricane projects protect populated areas," Riverside (Jul. 1994): 3.

Studies have shown that barrier islands provide important protection to the mainland by taking the brunt of a hurricane. Based on these parameters, as well as environmental and recreational benefits, the District believed that it would find a sufficient cost-benefit ratio, though as of 2002 the state had not provided cost-sharing assurances to fund additional studies.[27]

Larose to Golden Meadow, Louisiana

Originally approved as part of the Grand Isle and Vicinity Hurricane Protection Project in 1965, the Larose to Golden Meadow Hurricane Protection Project encountered far less opposition and proceeded more rapidly than other hurricane protection projects. The Larose to Golden Meadow project was intended to protect some 12,000 acres of developed and 24,000 acres of undeveloped land 30 miles southwest of New Orleans in Lafourche Parish from surges from the gulf and the GIWW. As originally conceptualized, the project provided for raising 38 miles of existing levee and building five miles of new levee and floodwalls to form a ring running south from the GIWW at Larose, along both sides of Bayou Lafourche to Golden Meadow. A major component was two floodgates, one each at Larose and Golden Meadow, on Bayou Lafourche. There would also be eight culverts – later replaced by pumping stations at state request – located at strategic points along the levees to help regulate interior drainage. The District received local cooperation assurances from the Lafourche Parish Police Jury in 1967, which were superseded by an Act of Assurance furnished by the South Lafourche Levee District in 1972. The New Orleans District completed the general design memorandum in 1972, which the chief of engineers approved the following year. Then in 1974, the New Orleans District filed the EIS. After New Orleans engineers made some changes in alignment to alleviate concerns of the U.S. Fish and Wildlife Service and agreed to develop environmental mitigation features, the EPA approved the plan. The chief of

[27] Quote from PL 106-53, Sec. 422, Aug. 17, 1999; Project Maps Book, Grand Isle; Project Fact Sheet, Grand Isle and Vicinity, Louisiana, May 20, 2000. On recent studies about the impact of barrier islands on hurricanes, see Coast 2050: Toward a Sustainable Coastal Louisiana (Baton Rouge: Louisiana Dept. of Natural Resources, 1998).

engineers approved the designs for the Golden Meadow and Larose floodgates in 1977 and 1978 respectively.[28]

Before construction began, however, the South Lafourche Levee District submitted modification of the original alignment in 1977 and 1978 based on requests from Clovelly Farms and the Louisiana Land and Exploration Company, who wanted their property included inside the levee system. In addition, new investigations revealed the original plan would have damaged 2,000 more acres of wetlands than originally determined. As a result, the New Orleans District revised the design of the eastern levee in March 1982 and again in April 1984 and submitted the final supplemental EIS in February 1985. Simultaneously, the New Orleans District developed a mitigation plan to protect the Pointe au Chien Wildlife Management Area from saltwater intrusion by building a levee extension with three weirs for water control north of Grand Bayou. Because the state had already completed two of the weirs and there was an urgent need to proceed with construction of the levees, the District submitted a separate EIS for the mitigation plan in April 1987.[29]

[Figure 33. Larose to Golden Meadow project]

As the New Orleans District resolved these issues, it proceeded with construction of the approved sections of levees and floodwalls. By 1987, the project was already 56 percent complete, including the two floodgates, large concrete structures with two steel gates providing a horizontal clearance of 56 feet. The District designed the gates to remain open most of the time to allow navigation of Bayou Lafourche. Once tidal levels reached three feet above mean sea level, the gates would be closed to prevent tidal surges and only open to allow passage of vessels seeking safe harbor, and then only if the head

[28] Final Supplemental Environmental Impact Statement, Larose to Golden Meadow, Louisiana, Hurricane Protection Project (New Orleans: NOD, Nov. 1984): 1-6; Project Fact Sheet, Larose to Golden Meadow, LA, Hurricane Protection Project, 7 May 2001; Project Maps Book, Flood Control Projects 2-34A, Larose to Golden Meadow (Hurricane Protection), Condition of Improvement, Sept. 30, 1997.
[29] Ibid.; Mitigation Report, Larose to Golden Meadow, Louisiana, Hurricane Protection Project (New Orleans: NOD, Apr. 1987): i-ii, 1-8.

differential was less than one foot. The District issued a $7.4-million contract to initiate construction of the Golden Meadow Floodgate in June 1982. The project was dedicated in September 1985, just in time to save lower Bayou Lafourche from Juan in October. The District issued a $3.7-million contract for the Larose Floodgate in June 1983 with an estimated completion date of 1985. However, after falling behind schedule because of contractor default, the Larose Floodgate was completed and dedicated in January 1987. With these major elements of the plan out of the way, the District proceeded with construction of the levees and floodwalls, issuing several contracts by the end of the decade. The project was 73 percent complete in 1994, 83 percent complete in 1997, and 90 percent complete in 2000. The scheduled completion date is 2008.[30]

[Figure 34. Larose floodgate]

Eye of the storm

It had been 10 years since the last major hurricane – Carmen – struck Louisiana in 1974. Then in a single year, three damaging hurricanes struck over a three-month period in 1985. First came Hurricane Danny on August 16, a minimal Category 1 hurricane that nevertheless did considerable damage. Danny developed in the Caribbean on August 12 and intensified into a hurricane on August 14. It reached maximum strength as it made landfall near Pecan Island and Lake Charles, and quickly slowed to tropical-storm strength. However, the storm caused structural damage in Abbeville, Grand Isle, and Slidell, while uprooting trees and destroying crops throughout south central Louisiana. Total damages were estimated to be near $14 million. On September 2, Hurricane Elena hit the Mississippi shore just east of the Mississippi River as a Category 3 hurricane. Immediate evacuations began along the Louisiana

[30] Annual History Report, 1987; NOD News Release, June 21, 1982; Col. L Kent Brown, Dedication Ceremony, Larose Floodgate (NOD-PAO File, Larose to Golden Meadow Hurricane Protection Project); Project Maps Book, Larose to Golden Meadow; "Construction Moves Ahead on All Fronts," Information Bulletin (Spr. 1986): 8; "The Building of Hurricane Protection"; Project Fact Sheet, Larose to Golden Meadow.

coast. By the time Elena entered Washington Parish only hours later, it had been downgraded to a Category 1 hurricane. Still, the storm downed numerous trees and power lines, and caused massive erosion in the Chandeleur islands. Elena caused four deaths, 98 injuries, and more than $1.3 billion in damages. Then on October 29, Hurricane Juan looped over the state, dumping 10 to 15 inches of rain across southwest Louisiana and southeast Texas. With storm surges of eight feet, Juan washed out roads and bridges, destroyed oil rigs and boats, overtopped levees, and trapped 1,200 residents on Grand Isle. Although barely a Category 1 storm, Juan ranks as the eighth costliest hurricane in U.S. history, causing $1.5 billion in damages and 63 deaths, of which $300 million and 12 deaths were in Louisiana. In each of the storms, the District's emergency operations center (EOC) tracked the storms and responded to the destruction with disaster aid.[31]

Altogether in Louisiana, Danny, Elena, and Juan caused more than $2.5 billion in damages and 19 deaths, mostly in central and southwestern areas of the state. Grand Isle was particularly hard hit, with the protective dune built by the Corps of Engineers partially destroyed, yet these works prevented an estimated $15 million in damages. Just a few miles away, the Golden Meadow Floodgate went into operation for the first time, preventing an unestimated amount of damage in flooding. New Orleans had been relatively lucky as the storms skirted around the city where hurricane protection measures were furthest from completion. For many involved in the projects, however, these close calls were alarms to resolve differences and push forward with the projects. Even before Juan hit, the Louisiana congressional delegation was pressing for increased funding and faster progress on the projects.[32]

When Hurricane Andrew hit Louisiana in August 1992, every indication was that it would be the worst disaster since Betsy, perhaps even worse. The storm hit Florida on August 24 as a Category 4 hurricane with sustained winds of 140 miles per hour and gusts of up to 175 miles per hour. After leaving a path of destruction 15 miles long and 22 miles wide, the storm entered the Gulf of Mexico, slowed by

---

[31] National Academy of Sciences, Hurricane Elena, Gulf Coast: August 29-Sept2, 1985 (Washington, D.C.: National Academy Press, 1991): 1-10; Public information, NOAA, National Climate Data Center, CSC, NWS, and National Hurricane Center (www.noaa.gov, www.ncdc.noaa.gov/ol/reports/, www.csc.noaa.gov/crs/cohab/hurricane/, www.srh.noaa.gov/lch/research/lahur.htm, www.nhc.noaa.gov); Colletti Interview.

landfall to a Category 3 hurricane. As it headed toward the Louisiana coast, the storm intensified to Category 4 again. The EOC, tracking the storm since before it hit Florida, began to brace for landfall at or near New Orleans by closing control structures, floodgates, and locks; closing gaps in the Lake Pontchartrain lakefront levee; and preparing for evacuation. By that evening, Andrew had taken a more westerly course. After skirting Grand Isle, it flirted for eight hours with coming aground as it gradually lost strength, and then struck ground at Franklin, Louisiana, near Morgan City as a Category 3 storm. As the storm moved up the Atchafalaya Basin towards Baton Rouge, it lost strength, and eventually the National Weather Service downgraded it to a tropical storm. Andrew was one of the worst natural disasters of the century in the United States, causing a total of $1.98 billion in damages, killing 26 people, destroying 80,000 homes, and leaving 250,000 homeless. While Florida bore the brunt of the storm's fury, in Louisiana there were more than $1 billion in damages, more than 21,000 homes destroyed or damaged, and eight deaths directly attributed to the hurricane. In addition, Louisiana experienced severe damage to buildings, utilities, and crops, and to the ecosystem of the Atchafalaya Basin, where downed trees and floodwaters impacted hundreds of species. Estimated damages to natural resources exceeded $266 million statewide.[33]

For weeks following the storm, the EOC continued to operate, coordinating with local agencies and providing trailers for the homeless and emergency pumps and generators to the 15 parishes declared disaster areas. When power was lost to the Berwick Water Treatment Plant, the District provided electrical cable to get the plant back in operation and shipped 6,000 gallons of bottled water to the nearby community of Bayou Vista. Evaluations after the storm proved that the hurricane projects prevented $224 million in damages. Though damaged, the Grand Isle protective beach and dune prevented $21 million in damages to the island. The New Orleans to Venice and Lake Pontchartrain and Vicinity projects prevented storm surge access to Venice, Buras, Chalmette, and Violet, and on the east and west banks in

---

[32] Ibid. See project descriptions above.
[33] Janet McDonnell, Hurricane Andrew Historical Report (Ft. Belvoir, Va.: OH-HQUSACE, 1993): 1-2; "After Action Report for Hurricane Andrew," NOD, Dec. 18, 1992; Hurricane Andrew Narrative (NOD-PAO File,

Jefferson Parish. The partially complete Larose to Golden Meadow project protected Larose, Cut Off, Galliano, Golden Meadow, and other nearby towns. "The storm put our hurricane protection projects to the test," said Col. Mike Diffley, the New Orleans District Engineer. "I'm proud to say that these projects passed that test with flying colors." [34]

In the 1998 storm season, new storms provided additional testing of the system. On September 10 and 11, 1998, Tropical Storm Frances struck the Louisiana and Texas coasts, causing the most severe coastal flooding in more than 20 years. Forming off the coast, it moved slowly, stalling for several hours after landfall on midnight of September 10 near Matagorda, Texas, before finally moving off to the west. It dropped more than 10 inches of rain across most of Louisiana. Grand Isle, Cameron, and Sabine Pass were largely underwater, as were parts of I-10. In New Orleans, the pressure of the rain pushed covers off manholes. Seven tornadoes wreaked havoc across southwest Louisiana near Lake Arthur, Estherwood, Basile, Oberlin, and Lafayette, causing more than $10 million in damages in Louisiana and Texas. Only days later, from September 21 to 30, Hurricane Georges, a Category 2 hurricane, terrorized the gulf coast and the Caribbean. The storm caused hundreds of deaths in the Caribbean nations and Puerto Rico before moving along the U.S. coast, where it dumped 15 to 30 inches of rain on Florida, Alabama, Mississippi, and Louisiana over two days. The eye passed just north of New Orleans before dwindling to a tropical storm. In the United States and its territories alone, the storm caused $5.9 billion in damages and 16 fatalities, the majority in Puerto Rico.[35]

Once again, hurricane protection provisions helped the New Orleans District survive the storms with minimal damage and inconvenience. The EOC monitored the storms and responded quickly to help flood victims. Even though Georges was a near miss for New Orleans, the Lake Pontchartrain and Vicinity Hurricane Protection Project alone prevented an estimated $749 million in damages, exceeding

---

Hurricane Andrew); National Disaster Survey Report: Hurricane Andrew: South Florida and Louisiana, August 23-26, 1992 (N.p.: NOAA, Nov. 1993): D1-E6; Public information (www.nhc.noaa.gov).

[34] Ibid.; Diffley quoted in Hurricane Andrew Briefing, Sept. 3, 1992 (Hurricane Andrew file).

[35] Colletti Interview; public information, NOAA, National Climate Data Center, Coastal Services Center, NWS, and National Hurricane Center (www.noaa.gov, www.ncdc.noaa.gov/ol/reports/, www.csc.noaa.gov/crs/cohab/hurricane/, www.srh.noaa.gov/lch/research/lahur.htm, www.nhc.noaa.gov).

the total cost of the project as of 1998. This was only a small percent of the cumulative total of $9.69 billion saved since 1983 by the Lake Pontchartrain project alone. "Our project not only worked, it demonstrated its worthiness as a public investment in dollars," Colonel Conner said.[36]

"Ultimately," Colonel Diffley said in 1992, "government proves its worth when it provides for the people it represents." During the hurricanes of the last quarter of the twentieth century, the government as represented by the New Orleans District came through in more ways than one. Although it was certainly true that without the support of individuals "all the Federal projects in the country can't successfully help or protect an area," as Diffley noted, the federal projects the District supported had saved lives and protected homes and businesses to the tune of hundreds of millions of dollars. Completing these marathon projects was in many cases an uphill battle, as the District worked to balance the need for greater hurricane protection with environmental concerns on the one hand and local funding or planning issues on the other. Though it took nearly two decades, the District finally found that balance and, by the end of the century, became a champion for many of the values it had accepted only begrudgingly in the early 1970s.

[36] Conner quoted in "Corps and sponsors prevent $749 million of Pontchartrain-area damage by 1998's Hurricane Georges," NOD News Release, Apr. 16, 1999.